Subject: Re: Minimum Noise Fraction Doubts...
Posted by Jeff N. on Tue, 30 Oct 2007 20:49:24 GMT
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On Oct 29, 5:41 am, Nuno Vilaça <nuno.avs...@gmail.com> wrote:
> On Oct 28, 7:43 pm, Nuno Vilaça <nuno.avs...@gmail.com> wrote:
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>> On 26 Out, 15:45, "Jeff N." <jnett...@utk.edu> wrote:
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>>> On Oct 26, 6:39 am, Nuno Vilaça <nuno.avs...@gmail.com> wrote:
>
>>>> Dear all,
>
>>>> I am going to use artificial neural networks (anns) to classify
>>>> different urban land-uses in belgium's flemish region. The other land
>>>> uses that not urban will be classified in braoder classes such as
>>>> agriculture, forest, water, others, etc etc. For this i will use modis
>>>> imagery covering 2001 to 2006.
>>>> I have made area fraction images (afis) from land use raster datasets
>>>> covering flanders.These datasets were provided by specialised belgium
>>>> agencies. From these datasets i calculated the percentage of each land
>>>> use occupation in a pixel size of 250 * 250 m² (same pixel size as the
>>>> modis imagery resolution that i 'll use). This operation gives me at
>>>> the end the so called afis.
>>>> These afis only cover brussels region, but they will work as reference
>>>> imagery to train the anns. After training the anns for the brussels
>>>> area, i can extrapolate these anns for the entire flemish region.
>>>> As i said before, i will use modis imagery with 250 * 250 m²
>>>> resolution, so the red and nir bands and also cleaned ndvi images,
>>>> i.e. without clouds, snow, etc etc... i now have an image in the red,
>>>> nir and ndvi for each month of 2005. This is the methodology how the
>>>> images were obtained:
>
>>>> I took the S1 (daily) images of Europe
>>>> Convert the Europe-S1 to Europe-S10 (WGSlatlon)
>>>> Cut out Belgium and convert to B72
>>>> Composit the Belgium-S10 BEL 72 images to S30 images
>>>> This was done for the red and nir band. They are 250m, the other bands
>>>> (blue, green,...) are 500m or more
>>>> Out of the red and Nir S30 image, I calculated the NDVI
>
>>>> I now need to perform either a pca (principal component analysis) or a
>>>> mnf (minimum noise fraction) to select which images i will use with
>>>> the anns to calculate classify the different urban land uses in
>>>> flanders. For what i read, mnf seems a better alternative to the pca
>>>> methodology. i then wish to calculate the mnf for the 2005 imagery (i

>>>> only have 2005 and 2003 imagery for now, but only ndvi for 2003). The
>>>> problem is how to do it using exclusively envi. I thought that i
>>>> should create a stack layer of all the monthly images with both red,
>>>> nir and ndvi images, which i did. From this stack layer i choosed the
>>>> menu transform -> mnf rotation -> forward mnf -> estimate noise
>>>> statistics from data. The output of this procedure goes as an attached
>>>> file.
>
>>>> i think that my methodology is not correct because: mnf should be
>>>> between bands and not images, right? So, i should pick band red, nir
>>>> and ndvi for january and see which one has less correlation with the
>>>> others, and perform each month separately? Because i am doing an mnf
>>>> to 12 images * 3 bands (red, nir and ndvi) i don't know if this is
>>>> correct... envi gives me an mnf graph where the first 5 images have
>>>> the highest eigenvalues. And supposing it's correct and looking at the
>>>> output graph from envi, i should use the eigenvalues of the first 5
>>>> images, because after these the correlation between images is strong?
>>>> But still, the xx axis of this graph shows the number of images and
>>>> not the bands, so , how correct can this be (i used 33 images for
>>>> 2005)? Anyway, if i look at the 5 first images given by the mnf
>>>> results, they look ok, and i can see that they not coincide with the
>>>> images composing the stack layer (there is no alphabetical match as i
>>>> took the images to form the stack layer by alphabetical order). I can
>>>> also see that it seems that no flags exist (absence of data due to
>>>> snow, ocean, etc etc). The values of the images can be lower than 0
>>>> but also around 75 (ocean), i do not know if you can tell something
>>>> from this.
>
>>>> thank you for your help!
>
>>>> nuno
>
>>> I'm not familiar with your datasets, nor am i completely sure what
>>> your exact problem is, so forgive me if i've completely mistaken your
>>> question. But my read on this is that you've compiled one huge image
>>> cube that is the combination of several multiband image cubes taken at
>>> different times. So you have all the bands for all the times compiled
>>> into one big dataset. If that's true, i would agree that this isn't
>>> the best way - it just doesn't sound like that image cube has any
>>> physical meaning anymore. Now, it's actually a fairly common practice
>>> to build image cubes such that every band in the image cube is,
>>> instead of being a measure of all wavelengths at a given time (the
>>> normal case), in fact a measure of a single wavelength at different
>>> times - a multitemporal cube vs. a multispectral cube. I suggest you
>>> consider doing it this way. In your case you'd build a "red band"
>>> cube for each point in the time series, a "nir band" cube for each
>>> time point, and an "ndvi cube." You'd have to do three different
>>> mnf's, then perhaps combine the results, but that makes more sense to

>>> me.
>
>>> Jeff- Ocultar texto citado -
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>>> - Mostrar texto citado -
>
>> Dear Jeff,
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>> yes, as i said, i have a total of 12 images of belgium in red, 12
>> images of belgium in nir and 12 images of belgium in red, so, one
>> image per month for each band and ndvi.
>> maybe you are right about your approach where i should separate the
>> bands and ndvi and perform a single mnf for each of these bands. but
>> in the end - if combining the three mnfs - wouldn't the result be more
>> or less the same as if i just join all the 36 images in a single
>> mnf??? i mean, i do understand your point of view and it's probably
>> less biased then mine, but it seems to me that at the end it'll turn
>> up the same...
>> anyway, i think you are correct with ur multitemporal approach for the
>> single bands, about the combination mnf i think i'll give it a try!!!
>> thank you!!!- Hide quoted text -
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>> - Show quoted text -
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> Jeff,
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> i used your procedure sugestion and it seems that it works ok when
> doing mnf separately for each band, but when combining the mnfs of the
> 3bands into a single mnf, the outputs are quite bad as envi suggests
> that i only use 2images. one has simply no data at all, and the other
> one does have data, but still some parts are flaged (so, no data)...
> i'm still wondering which approach is better...
> regards,
> nuno

I think i wasn't clear enough in my original post when i just
mentioned combining mnf's without explaining what i meant. Combining
all your image cubes into a single large one doesn't have a physical
meaning...consider what the z profile would look like for such a
cube. The x-axis would have data points for both time and wavelength
combined. So when you run statistical tricks like mnf's on that kind
of dataset, you're going to get garbage out b/c you put garbage in.
Thats why i suggesting making multitemporal cubes for each wavelength,
b/c now each z profile's x-axis is time. but then if you just
concatenate all your individual cubes into a single huge cube post-mnf
now as opposed to pre-mnf (what you were doing), you still have data
with no physical meaning - that's really not what i was suggesting you
do. In the simplest terms, I think i meant that you can use the

different multitemporal cubes to create single displays that get your point across. You could for example, take the 1st MNF band from each of the temporal cubes and combine them into a single RBG display...although i don't know what your science goals are...this may or may not be appropriate. You also have a set of time series now, so you can do things like measure the average value over time in each of the cubes if that's appropriate to you. Basically, you can do whatever you need to do, as long as it's got some kind of physical meaning :) And you may decide to not combine your analyses of the different cubes at all...it all depends on what your science goals are.

Jeff
